McLAREN 602

Control Preamplifier

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The McLaren 02 component series represents a unique synthesis of art, science and technology — the realisation of a design philosophy dedicated simply to the accurate reproduction of music. Form, function and performance specifications all express and testify to this basic ideal. But most important is the innate ability of the range to recreate a true musical experience.

The McLaren 602 is a high gain, high resolution "straight line" preamplifier, fully compatible with a wide range of signal sources from low output moving coil cartridges to high output CD players.

Phono gain can be switched for either moving or fixed coil cartridges. Provision is made for optimum cartridge loading. An input buffer preceeds the two-stage passive/active RIAA equalisation where particular care and attention has been given to achieving both amplitude and phase accuracy, not only in absolute terms, but to ensure precise matching between channels.

Power supply design also makes a major contribution to performance. Individual stages of each channel have their own locally regulated supplies fed from a central regulated supply incorporating a heavy duty shielded toroidal transformer.

As a result the 602 possesses superlative dynamic and imaging qualities — clearly focused detail revealing the most subtle instrumental and vocal timbres, with a true perception of image depth and height.

The high undistorted output voltage capability of the line stage with an unusually low output impedance, ensures that the 602 will fully drive any power amplifier even via extreme lengths of shielded cable.

Construction is to the highest engineering standards. The case is entirely non-ferrous — faceplate and side blocks are cut and machined from proprietory extruded sections, top and bottom covers coated with an attractive and durable textured finish. Front fixing screws, nameplate and all input and output sockets on the rear panel are 24-karat gold plated. Control knobs are turned from solid aluminium, satin anodised to harmonise with the front panel.

Internal construction features gain selected semiconductors and highest quality passive components mounted on a double-sided military grade glass epoxy board. The precision film potentiometers and sealed switches with self-wiping contacts have been chosen not only for their sonic excellence, but also for their smooth precise action and tactile qualities.

Features

- Phono gain adjustable for MC or MM.
- User-selectable phono loading.
- Two-stage RIAA equalisation— passive high frequency followed by active low frequency equalisation.
- Output muting relay to avoid on/off switching transients.
- Heavy duty toroidal power transformer.
- Individual regulated power supply for each stage.
- Highest quality components, including
  - — gain selected semiconductors
  - — polypropylene/polystyrene capacitors
  - — metal film resistors
  - — conductive film potentiometers
  - — gold plated signal connectors
- Star grounding system.

Specifications

Input Sensitivities (for rated output, 1kHz)
Phono MC: 100 μV
MM: 1.0 mV
High Level/Tape Play: 100 mV

Gain Structure (at 1kHz)
Phono Section MC: 60dB
MM: 40dB
Line Section: 20dB

Input Impedances
Phono: 47k ohm (user selectable to any lower value)
High Level/Tape Play: 50k ohm

Signal/Noise Ratios (A-WTD/UNWTD)
Phono MC (ref. 0.5mV):76dB/68dB
MM (ref. 5mV): 82dB/74dB
High Level/Tape Play (ref. 500mV): 100dB/94dB

Input Overload Levels (at 1kHz)
Phono MC: 15mV
MM: 150mV
High Level/Tape Play: Infinite

Output Levels
Rated: 1.0V
Maximum: 16V

Output Impedances
Phono Section (Tape Rec.): 100 ohm
Main Out: 100 ohm

Frequency Response
Phono (RIAA Equ.):
±0.2dB 20Hz-20kHz
High Level/Tape Play:
+0, 1dB 5Hz-100kHz

Balance Control
±3dB each channel

Distortion
Less than 0.015% THD 20Hz-20kHz at rated output, any input/output

Phase
Phono through main out: Noninverting
High Level/Tape Play through main out: Inverting
Phono through Tape Rec: Inverting

Power Requirements
110-120/220-240VAC, 50-60Hz, 8VA

Dimensions (inches/mm)
16.5/420(W), 4.1/105(H), 11.2/285(D)

Shipping Weight (lb/kg)
14.3/6.5

Specifications subject to change without notice

McLAREN AUDIO
A division of **Zetka Industries Limited,** P.O. Box 30-406, Lower Hutt, New Zealand. Telephone (04) 683 903. Telex NZ 31255 INTCOM.

Contents

Introduction

The McLaren 602 is a "straight line" preamplifier, with input facilities for accepting moving coil or moving magnet phono cartridges, as well as five high level inputs including two tape inputs and a dedicated CD input.

The phono input provides 60(MM) or 80dB (MC) of gain (from input to output of the preamplifier) at 1kHz. The stage is split into two active gain blocks, the first one is a has a flat frequency response and switchable gain. The second stage incorporates the RIAA equalisation as well as some further gain. An extra set of phono sockets is provided at the input to allow the phono cartride being used to be loaded appropriately.

The high level inputs provide 20dB of gain (max) with a flat frequency response. Volume and balance controls are also provided in this stage,

Two tape record outputs are also provided. Record signal is selected by means of a second selector switch completely independant of the input selector.This switching is done at high level and no amplification is provided between the tuner,CD,Aux or tape inputs and the record output.

Operating Instructions

1. Phono Operation
2. Line Level Operation
3. Tape Record Output

1. Phono Operation
Moving coil or Moving magnet operation

Note The Mclaren 602 is normally shipped set for moving magne operation.

If the unit is not set to the gain required, the gain will nee to be reset by following the procedure below.

WARNING Removing the top cover may expose DANNGEROUS VOLTAGES.

ENSURE THE UNIT IS DISCONNECTED FROM THE MAINS.

a. Using the allen key provided remove the four cap scre holding the top cover, and slide the cover back .
b. Locate the two DIL switches on the right hand side of t board viewed from the front of the unit. In front of the D switches, printed on the board, is a chart showing the postions the poles for Moving Coil (MC) or Moving Magnet (MM) operatio Poles 1-3 select the gain of the input stage, while pole 1 selec the phono loading of either 100ohms or 47kohms.

POLE	MM	MC	LOADING
1	OFF	ON	ON=100ohms OFF=47kohms
2	ON	OFF	
3	OFF	ON	
4	ON	OFF	

c. Use a small screwdriver or other suitable instrument to mo each lever to the requied position making sure it is positive locked in position.
d. Replace the top cover and screws.

Cartridge Loading

The correct phono input impedance for most Moving Magn cartridges (and some moving coils) is 47kohms (Pole 1 OFF). reqqired, lower values can easily be set by inserting phono plug loaded with appropriate resistors, into the phono loading socke

next to the phono input sockets on the rear panel. A pair of phono plugs is provided for this purpose.

For many Moving Coil cartridges a suitable load is 100ohms (Pole 1 ON) .Again lower values can be obtained by the using phono plugs provided loaded as required.

NOTE The loading plug resistance is placed in parallel with either 47kohms or 100ohms depending on the position of pole 1.

Once the phono gain and loading are correct and the unit reassembled. proced as follows...

a. Connect the output sockets (Located at the left hand end of the unit viewed from the front) to a suitable power amplifier with a high quality interconnect cable taking care to not reverse the channels.

b. Connect the turntable output to the phono input socets (Located at the right hand end of the preanplifier viewed from the front). Connect the earth (ground) lead of the turntable to the terminnal provided.

c. Connect the unit to the mains and switch on. after approximately 10 seconds delay a slight click may be heard from the muting relay, indicating that it has opened alowing the signal to pass.

d. Set the volume control to a low listening level (about 8 oclock).

e. Select PHONO on the input selector.

f. Switch on the turntable and power amplifier.

g. Reset the volume to a prefered listening level.

2. High Level Operation

a. Connect the output sockets to a suitable power amplifier with a high quality interconnect cable taking care to not reverse the channels.

b. Connect the output from the CD Player tuner or Tape deck etc, to the apropriate input sockets on with a high quality interconnect cable taking care to not reverse the channels.

c. Connect the unit to the mains and switch on. After approximately 10 seconds delay a slight click may be heard from the muting relay, indicating that it has opened allowing signal to pass.

d. Set the volume control to a low listening level,(about 8 oclock).

e. Select the apropriate input on the input selector.

f. Switch on the input source and power amplifier.

g. Reset the volume to a prefered listening level.

3. Tape Record Outputs

These outputs provide a line level recording signal of the source selected on the RECORD selector.

a. Connect the tape record outputs on the McLaren 602 to the record inputs of the tape deck and the tape play sockets to the

play output of the tape deck.

b. Connect the source you wish to record following instructions in the apropriate section above.

c. Select the required source on RECORD selector, turn tape deck on and begin recording.

NOTE Any source may be selected on the INPUT SELECTOR wh recording the same or any other source.

Mechanical Description

The McLaren 602 has seven major mechanical components in construction. these are...

1. The main PC Board. Which carries almost all the electro conponents, including control potentiometers, switches and in socets.
2. Front Panel. Made from extruded and drilled alumini Finish is light bronze anodising. The front panel carries mains switch, tone switch, bass and teble controls, volume balance , input and tape selectors.
3. Back panel. The back panel carries the mains fu earthing(grounding), input and output sockets. This panel is m from punched sheet aluminium and finished with black powdercoat
4. Top Cover. Made from sheet aluminium and finished with bl powdercoat,

NOTE Removal of the top cover gives access to the compon side of the PC Board.

5. Bottom Cover. Made from sheet aluminium and finished w black powdercoat,

NOTE Removal of the bottom cover gives access to the sol side of the PC Board.

6. and 7. Left and Right hand side rails. Made from extru aluminium and finishsed with black powdercoat.

Access for scervicing is by removing the top and bottom pan which are secured by 3/16" cap screws. (The screws can be remo using the 5/32" allen key provided with the unit)

NOTE Care should be taken to not mix top and bottom screws top cover screws are longer and may damage the pretapped thre provided for the bottom cover screws

Electrical Description

The McLaren 602 consists of 10 stages (5 per channel) and a power supply.FIG 1.

From input to output these are (Description for one channel only)...

Phono Input Stage FIG 3

This stage consists of two input differential pairs made up of 2SC2546 transistors and 2SA1084 transistors, these are run at a current of 5mA per transistor to ensure a low noise figure when the circuit is driven from very low impedance sources (3-100ohms).

The two input pairs then drive a push-pull ,class A output stage using BC550 and BC560 transistors running at 9mA allowing the stage to drive the low impedance feedBack loop of the moving coil gain setting.(the low impedance feedBack loop is required to keep thermal noise to a minimum.) Switching complete feedBack loops has been used to allow moving magnet gain to be incorporated in the preamplifier as well as moving coil.

The stage has a flat frequency responce with gains of 146 times (43dB) or 11.9 (21.5dB). Output impedance is less than 50ohms at 1kHz

The input to the stage is DC coupled with loading switchable between 47kohms and 100ohms, DC coupling of the input ensures that distortion is minimised at this critical interface. The output from the stage is AC coupled via 1uF polypropylene capacitor to avoid DC offsets being amplified by consequent stages.

There is also a regulated power supply with an output of + and - 11Volts suppling power to the stage, this supply is a capacitor multiplier type which provides the good noise performance required and good regulation.

RIAA Equalisation Stage FIG4

This stage is made up of 2 input differential pairs made up of BC550B and BC560B transistors. These are run at 1mA per pair (500uA per device).This drives a Class A, push-pull output stage made up of BC550 and BC560 transistors running at 12mA.

At the input to the stage there is a passive RC filter using a 5K1 resistor and a 30nF capacitor, This provides the high frequency RIAA equalisation. The low frequency section of the characteristic is formed by the 3n3 capacitor, 91K and 1MO resistors in the feedback loop.

As for the moving coil stage the input is DC coupled and the output is AC coupled through a 1uF polypropylene capacitor. Gain of the section is 100 times (40dB) at 1kHz. The input impedance of the stage is 9kohms and the output impedance is 150ohms.

The RIAA stage has its own regulated power supply consisting of two three terminal regulators.

Switching Stage FIG 5

This is a totally passive stage cosisting of two "flex switches. The flex switches provide for the selection of progra material on the inputs of the preamplifier for either auditionin or recording.

The two "flex" selector switches are connected in such a wa that they function inependantly of one another, allowing any inpu to be selected while recording the same or any other input.

Line Stage FIG 6

The first part of the line stage is the volume control, whic is a 50kohm potentiometer operating as a passive attenuator.

The active part of the line stage follows the volume control and is made up of two differential pairs with BC550 and BC56 transistors running at 1mA (500uA per device). This is followed b a Class A, push-pull output stage using BC550 and BC56 transistors running at 12mA.

This stage has a flat frequency responce with a gain of 1 times (20dB) with the balance at the mid point, Using the balanc control located in the feedBack loop the gain can be varied by and - 3dB.

Once more this stage is run from a regulated power supply usin three terminal regulators.

As for the other stages the input is DC coupled and the outpu AC coupled through a 1uF Polypropylene capacitor.

Input impedance to the stage is 50kohms and the ouput impedanc is 100ohms at 1kHz.

Functional Check Procedure

The following is a full functional check procedure for the McLaren 602, some of which may not be required for checking specific problems.

Check Procedures

1. Power Transformer Taps
2. Noise.....(i) phono
   (ii) High level
3. Input Sensitivity...(i) Phono
   (ii) High Level
4. Input Overload.....Phono
5. Distortion
6. RIAA Responce.....Phono
7. Bandwidth.....High Level
8. Crosstalk.....All Inputs
9. Relay Operation
10. Balance Control

Power Transformer Taps

CAUTIONCheck that the unit is set for the mains voltage being used.

To change the mains voltage setting proced as follows...

WARNING Removing the top cover may expose DANGEROUS VOLTAGES. Ensure that the unit is DISCONNECTED FROM THE MAINS.

a. Using the 5/32" allen key provided, unscrew the four cap screws which secure thetop cover and slide it back.

b. Remove the bottom cover by removing the four cap screws securing it with the 5/32" allen key provided.

c. Locate on the top side of the board, in the front left hand corner (viewed from the front of the unit),next to the mains transformer, an area marked with 0 and 110V. See FIG 8. USE ONLY WIRE WITH MAINS RATED INSULATION.

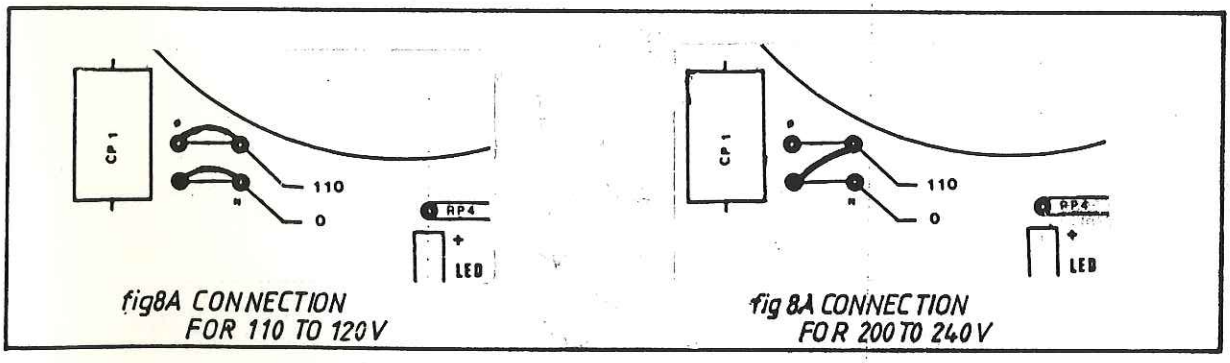


fig8A CONNECTION FOR 110 TO 120V

fig 8A CONNECTION FOR 200 TO 240V

d. For 100-120Vac mains connect as shown in FIG 8A .
   For 200-240Vac mains connect as shown in FIG 8B .

WARNING Joints must be soldered carefully and must be secure.

e. Replace top and bottom covers and secure with the apropriate cap screws.

Noise Check

(i) Phono

NOTE Check the gain setting of the phono stage, following the operating instructions Pg 2

High Gain

a. Load the phono input by using pole 1 of the gain selector switch set to 100ohms (Pole 1 ON), and a futher 100ohm loading plug.
b. Plug a measuring instrument (preferably an audio volt meter) into the pre out sockets taking care to avoid hum loops. Set the volume control to maximum.
c. Set the input selector to PHONO.
d. Plug the unit into the mains and switch on.
e. Read the measuring instrument used.

NOTE At this sensitivity the preamplifier is sensitive to stray magnetic and electric fields, so care should be taken to keep transformers etc well away from the unit under test.

Noise for the McLaren 602 Phono high gain should be
Unwieghted -54dB ref 1V at the output = -68dB ref 500uV at the input.
Wieghted -62dB ref 1V at the output = -76dB ref 500uV at the input.

Low Gain

a. Load the input by using pole 1 of the gain selector switch set to 47kohms (Pole 1 OFF), and a further 1kohms loading plug.
b. Plug a measuring instrument (preferably an audio volt meter) into the pre out sockets taking care to avoid hum loops set the volume control to maximum.
c. Set the input selector to PHONO.
d. Plug the unit into the mains and switch on.
e. Read the measuring instrument used.

NOTE At this sensitivity the preamplifier is sensitive to stray magnetic and electric fields, so care should be taken to keep trnsformers etc well away from the unit under test.

Noise for the McLaren 602 Phono low gain should be
Unwieghted -60dB ref 1V at the output = -74dB ref 5mV at the input.
Wieghted -68dB ref 1V at the output = -82dB ref 5mV at the input.

(ii) High Level

a. Load the appropriate input sockets with loading plugs with 10Kohm resistors in them.
b. Plug a measuring instrument (preferably an audio volt meter) into the pre out sockets, and set the volume control to maximum.
c. Set the input selector to the input being measured.
d. Plug the unit into the mains and switch on.
e. Read the measuring instrument used.

High Level input noise for the preamplifier should not exceed
Unwieghted -80dB ref 1V at the output = -94dB ref 500mv at the input
Wieghted -91dB ref 1V at the output = -100dB ref 500mv at the input

Input Sensitivity

(i) Phono

NOTE Check the gain setting of the phono stage, using the instructions in the operating instructions Pg 2

NOTE Take care to avoid hum loops when measuring phono sensitivity as the hum will lead to an incorrect measurement.

High Gain

a. Connect a signal generator to the left hand PHONO input socket.
b. Connect a measuring instrument (Preferably an audio voltmeter) to the left hand pre out socket.
c. Set the volume control to maximum, and the input selector to the PHONO input.
d. Ensure that the input impedance is set at 47Kohms (Pole 1 OFF).
e. Plug the unit into the mains and switch on.
f. Set the signal generator to a 1kHz sine wave and ajust its level to give 10Vrms at the preamplifier output.
g. Measure the signal level at the PHONO input.
The input signal for 10Vrms output should be 1mv rms.
h. Repeat the procedure for the other channel.

Low Gain

a. Connect a signal generator to the left hand PHONO input socket.
b. Connect a measuring instrument (Preferably an audio voltmeter) to the left hand pre out socket.
c. Set the volume control to maximum, and the input selector to the PHONO input.
d. Ensure that the input impedance is set at 47Kohms (Pole 1 OFF).

e. Plug the unit into the mains and switch on.
f. Set the signal generator to a 1kHz sine wave and ajust its level to give 10Vrms at the preamplifier output.
g. Measure the signal level at the PHONO input.
The input signal for 10Vrms output should be 10mv rms.
h. Repeat the procedure for the other channel.

High Level

a. Connect a signal generator to the left hand input socket on the apropriate input.
b. Connect a measuring instrument (Preferably an audio voltmeter) to the left hand pre out socket.
c. Set the volume control to maximum, and the input selector to the apropriate input.
e. Plug the unit into the mains and switch on.
f. Set the signal generator to a 1kHz sine wave and ajust its level to give 10Vrms at the preamplifier output.
g. Measure the signal level at the apropriate input.
The input signal for 10Vrms output should be 1V rms.
h. Repeat the procedure for the other channel.

Record Outputs

(i) Phono

NOTE Check the gain setting of the phono stage, using the instructions in the operating instructions Pg 2

NOTE Take care to avoid hum loops when measuring phono sensitivity as the hum will lead to an incorrect measurement.

High Gain

a. Connect a signal generator to the left hand PHONO input socket.
b. Connect a measuring instrument (Preferably an audio voltmeter) to the left hand REC socket.
c. Set the Record selector to the PHONO input.
d. Ensure that the input impedance is set at 47Kohms (Pole 1 OFF).
e. Plug the unit into the mains and switch on.
f. Set the signal generator to a 1kHz sine wave and ajust its level to give 1Vrms at the record output.
g. Measure the signal level at the PHONO input.
The input signal for 1Vrms output should be 1mv rms.
h. Repeat the procedure for the other channel.

Low Gain

a. Connect a signal generator to the left hand PHONO input socket.
b. Connect a measuring instrument (Preferably an audio voltmeter) to the left hand REC socket.

c. Set the Record selector to the PHONO input.
d. Ensure that the input impedance is set at 47Kohms (Pole 1 OFF).
e. Plug the unit into the mains and switch on.
f. Set the signal generator to a 1kHz sine wave and ajust its level to give 1Vrms at the record output.
g. Measure the signal level at the PHONO input.
The input signal for 1Vrms output should be 10mv rms.
h. Repeat the procedure for the other channel.

High Level

a. Connect a signal generator to the left hand input socket on the apropriate input.
b. Connect a measuring instrument (Preferably an audio voltmeter) to the left hand REC socket.
c. Set the record selector to the appropriate input.
e. Plug the unit into the mains and switch on.
f. Set the signal generator to a 1kHz sine wave and ajust its level to give 1Vrms at the record output.
g. Measure the signal level at the appropriate input.
The input signal for 1Vrms output should be 1V rms.
h. Repeat the procedure for the other channel.

Input Overload Phono

NOTE Check the gain setting of the phono stage, using the instructions in the operating instructions Pg 2

High Gain

a. Connect a signal generator to the left hand PHONO input socket.
b. Connect an ocsilloscope to the left hand pre-out socket.
c. Set the input selector to the PHONO input.
d. Ensure that the input impedance is set at 47kohms (Pole 1 OFF).
e. Plug the unit into the mains and switch on.
f. Set the signal generator to a 1kHz sine wave and ajust its level to give gradually while reducing the volume control setting so that the output does not exceed 15Vrms. Continue increasing the input level until clipping becomes visible.
g. Measure the signal level at the PHONO input.
Input Overload should be 15mV at 1kHz.

Low Gain

a. Connect a signal generator to the left hand PHONO input socket.
b. Connect an ocsilloscope to the left hand pre out socket.
c. Set the input selector to the PHONO input.
d. Ensure that the input impedance is set at 47Kohms (Pole 1 OFF).

e. Plug the unit into the mains and switch on.
f. Set the signal generator to a 1kHz sine wave and ajust its level to give gradually while reducing the volume control setting so that the output does not exceed 15Vrms. Continue increasing the input level until clipping becomes visible.
g. Measure the signal level at the PHONO input.
Input Overload should be 150mV at 1kHz.

Distortion (THD)

All Inputs

a. Connect a low distortion signal generator to the left hand input socket of the appropriate input.
b. Connect a distortion analyser to the left hand pre out socket.
c. Set the input selector to the appropriate input.
d. Ensure that the input impedance is set at 47kohms (Pole 1 OFF) if measuring the phono input.
e. Plug the unit into the mains and switch on.
f. Ajust the analyser using the manufacturer's instructions to give the requied measurements.
g. Reapeat the above procedure for the right hand channel.

NOTE Avoid running the preamplifier at levels at which the input may become overloaded or noise may make a significant contribution to measured distortion.

NOTE Take care to avoid hum loops when measuring Distortion as the hum will lead to an incorrect measurement.

Distortion of less than 0.015% should be achived from 20Hz to 20kHz.

RIAA Response

a. Connect a signal generator to the left hand PHONO input socket.
b. Connect a measuring instrument (Preferably an audio voltmeter) to the left hand pre out socket.
c. Set the volume control to 12 oclock, and the input selector to the PHONO input.
d. Ensure that the input impedance is set at 47Kohms (Pole 1 OFF).
e. Plug the unit into the mains and switch on.
f. Set the signal generator to a 1kHz sine wave and ajust its level until a convenient reference output level is reached.
g. Sweep the signal generator frequency up and or down to the spot frequncies below and measure the output with respect to the 1kHz reference.
h. Repeat the above procedure for the right hand channel.

NOTE Take care to avoid hum loops, and overloading the input

when measuring RIAA response, as the hum or an overload will lead to an incorrect measurement.

RIAA Response

FREQUENCY	OUTPUT ref 1kHz	
50Hz	+17.0dB	The peamplifier should conform to this response to within + or - 0.2dB
100Hz	+13.1dB	
500Hz	+ 2.6dB	
1kHz	+ 0.0dB	
2kHz	- 2.6dB	
5kHz	- 8.2dB	
10kHz	-13.7dB	
15kHz	-17.2dB	
20kHz	-19.6dB	

Bandwidth

a. Connnect a signal generator to the left hand input socket of one of the high level inputs.
b. Connect a measuring instrument (Preferably an audio voltmeter) to the left hand pre out socket.
c. Ensure that the tone switch is in the BYPASS position and set the volume control to maximum.
d. Plug the unit into the mains and switch on.
e. Set the signal generator to 1kHz and a level so that the preamplifier output level is at a convenient reference.
f. Now sweep the frequecy up or down to find the -1dB and -3db points.

These should be at -1dB at 50kHz and 20Hz
-3dB at 100kHz

g. Repeat the procedure for the other channel.

Crosstalk

Phono

a. Connnect a signal generator to the left hand input socket of the PHONO input.
b. Connect a measuring instrument (Preferably an audio voltmeter) to the left hand pre out socket.
c. Ensure that the tone switch is in the BYPASS position and set the volume control to about 12 oclock.
d. Plug the unit into the mains and switch on.
e. Set the signal generator to 1kHz and a level so that the output level is at a convenient reference.
f. Measure the output from the right hand channel by connecting a measuring instrument the the right hand output socket.
g. Repeat steps b,e and f for spot frequencies across the audio band. Substitute the measuring frequency for 1kHz in step e.

Crosstalk should be better than

20Hz to 2kHz better than -80dB ref the driven channel.
2kHz to 20kHz better than -60dB ref the driven channel.

h. Repeat the above procedure for the other channel

High Level

a. Connnect a signal generator to the left hand input socket o
a high level input.
b. Connect a measuring instrument (Preferably an audi
voltmeter) to the left hand pre out socket.
c. Ensure that the tone switch is in the BYPASS position an
set the volume control to about 12 oclock.
d. Plug the unit into the mains and switch on.
e. Set the signal generator to 1kHz and a level so that the
preamplifier output level is at a convenient reference.
f. Measure the output from the right hand channel by connectin
a measuring instrument the the right hand output socket.
g. Repeat step f for spot frequencies across the audio band.
There is no need to re adjust the input level.
Crosstalk should be better than

20Hz to 2kHz better than -80dB ref to the driven channel.
2kHz to 20kHz better than -60dB ref to the driven channel.

h. Repeat the above procedure for the other channel

Relay Operation

a. Connnect a signal generator to the left hand input socket of
a high level input.
b. Connect a measuring instrument (Preferably an audio
voltmeter) to the left hand pre out socket.
c. Set the volume control to about 12 oclock.
d. Set the signal generator to give a preamplifier output of 1V
approx.
e. Plug the unit into the mains and switch on.
f. Output should not imeadiately apear, there should be a 10
second delay, then a slight click will be heard and the signal
will be present at the output.
h. Repeat the above procedure for the other channel

NOTE Output should be muted imeadiately on swich off.

Balance Control

a. Connnect a signal generator to the left hand input socket of
a high level input.
b. Connect a measuring instrument (Preferably an audio
voltmeter) to the left hand pre out socket.
c. Set the volume control to about 12 oclock.
d. Plug the unit into the mains and switch on.
e. Set the signal generator to 1kHz and a level so that the

preamplifier output level is at a convenient reference.

f. Rotate the balance control Clockwise. The output from the left channel should fall by 3dB. Anticlockwise rotation will increase the output by 3dB.

g. Repeat the above procedure for the right hand channel.

For the right hand channel Anticlockwise rotation will decrease the output from the right channel by 3dB. Clockwise rotation will increase the output by 3dB.

Parts List

PC Board Number	Supplier Part No.	Description
Capacitors		
CIR1,CIL1	Philips 2222-427-41501	150pF Polystyrene cap
CIR2,CIL2	Philips 2222-427-41002	1nF Polystyrene cap
CIR3,CIL3	Wima MKP10 1uF 160V	1uF 160V Polypropylene
CIR4,CIL4	Philips 2222-035-55222	2200uF 16V Electrolytic
CIR5,CIL5	Philips 2222-035-55222	2200uF 16V Electrolytic
CIR6,CIL6	Philips 2222-368-41104	0.1uF 250V Polyester cap
CIR7,CIL7	Philips 2222-368-41104	0.1uF 250V Polyester cap
CER1,CEL1	Philips 2222-424-41503	15nF Polystyrene cap
CER2,CEL2	Philips 2222-424-43302	3.3nF Polystyrene cap
CER3,CEL3	Wima MKP10 1uF 160V	1uF 160V Polypropylene
CIR4,CIL4	Philips 2222-035-58101	100uF 63V Electrolytic
CIR5,CIL5	Philips 2222-035-58101	100uF 63V Electrolytic
CLL1,	Philips 2222-680-09828	8.2pF Ceramic cap
CLR1,	Philips 2222-680-10109	10pF Ceramic cap
CLR2,CLL2	Wima MKP10 1uF 160V	1uF 160V Polypropylene
CLR3,CLL3	Philips 2222-035-59228	2.2uF 63V Electrolytic
CLR4,CLL4	Philips 2222-035-59228	2.2uF 63V Electrolytic
CP1,CP9	Philips 2222-330-00473	47nF 250Vac polyester
CP2,	Philips 2222-330-18102	1000uF 50V Electrolytic
CP3,CP4	Philips 2222-330-18102	1000uF 50V Electrolytic
CP5,CP6	Philips 2222-368-41104	0.1uF 250V Polyester cap
CP7,CP8	Philips 2222-035-58101	100uF 63V Electrolytic
Resistors		
0ohm	Philips 2322-181-90018	0ohm resistor
RIR1,RIL1	Philips 2322-151-54703	47Kohm 1% Resistor
RIR2,RIL2	Philips 2322-151-51501	150ohm 1% Resistor
RIR3,RIL3	Philips 2322-151-51002	1Kohm 1% Resistor
RIR4 RIL4	Philips 2322-151-51002	1Kohm 1% Resistor
RIR5,RIL5	Philips 2322-151-51501	150ohm 1% Resistor
RIR6,RIL6	Philips 2322-151-53304	330Kohm 1% Resistor
RIR7,RIL7	Philips 2322-151-54702	4.7Kohm 1% Resistor
RIR8,RIL8	Philips 2322-151-54708	4.7ohm 1% Resistor
RIR9,RIL9	Philips 2322-151-56801	680ohm 1% Resistor
RIR10,RIL10	Philips 2322-151-54301	430ohm 1% Resistor
RIR11,RIL11	Philips 2322-151-52209	22ohm 1% Resistor
RIR12,RIL12	Philips 2322-151-52209	22ohm 1% Resistor
RIR13,RIL13	Philips 2322-151-58202	8.2Kohm 1% Resistor
RIR14,RIL14	Philips 2322-151-58202	8.2Kohm 1% Resistor
RIR15,RIL15	Philips 2322-151-51001	100ohm 1% Resistor

RER1,REL1	Philips	2322-151-55102	5.1Kohm 1% Resistor
RER2,REL2	Philips	2322-151-54702	4.7Kohm 1% Resistor
RER3,REL3	Philips	2322-151-53602	3.6Kohm 1% Resistor
RER4,REL4	Philips	2322-151-52403	24Kohm 1% Resistor
RER5,REL5	Philips	2322-151-52403	24Kohm 1% Resistor
RER6,REL6	Philips	2322-151-53602	3.6Kohm 1% Resistor
RER7,REL7	Philips	2322-151-52704	270Kohm 1% Resistor
RER8,REL8	Philips	2322-151-52704	270Kohm 1% Resistor
RER9,REL9	Philips	2322-151-51501	150ohm 1% Resistor
RER10,REL10	Philips	2322-151-51501	150ohm 1% Resistor
RER11,REL11	Philips	2322-151-51005	1Mohm 1% Resistor
RER12,REL12	Philips	2322-151-59103	91Kohm 1% Resistor
RR9,RL9	Philips	2322-151-51002	1Kohm 1% Resistor
RLR1,RLL1	Philips	2322-151-51203	12Kohm 1% Resistor
RLR2,RLL2	Philips	2322-151-53602	3.6Kohm 1% Resistor
RLR3,RLL3	Philips	2322-151-52403	24Kohm 1% Resistor
RLR4,RLL4	Philips	2322-151-52403	24Kohm 1% Resistor
RLR5,RLL5	Philips	2322-151-53602	3.6Kohm 1% Resistor
RLR6,RLL6	Philips	2322-151-51501	150ohm 1% Resistor
RLR7,RLL7	Philips	2322-151-51501	150ohm 1% Resistor
RLR8,RLL8	Philips	2322-151-59103	91Kohm 1% Resistor
RP1,	Philips	2322-151-59103	91Kohm 1% Resistor
RP2,	Philips	2322-191-33901	390ohm 5% 1.6WATT Resistor
RP3,	Philips	2322-151-52204	220Kohm 1% Resistor
RP4,	Philips	2322-151-52002	2Kohm 1% Resistor

NOTE All Resistors are .6watt unless specified

Transistors

TIR1,TIL1	Hitachi	2SC2546	Low Noise Transistor
TIR2,TIL2	Hitachi	2SC2546	Low Noise Transistor
TIR3,TIL3	Hitachi	2SA1084	Low Noise Transistor
TIR4,TIL4	Hitachi	2SC1084	Low Noise Transistor
TIR5,TIL5	Philips	BC550B	Low Noise Transistor
TIR6,TIL6	Philips	BC560B	Low Noise Transistor
TIR7,TIR8	RCA or equiv	TIP29A	1Amp Transistor
TIR9,TIR9	RCA or equiv	TIP30A	1Amp Transistor
TER1,TEL1	Philips	BC550B	Low Noise Transistor
TER2,TEL2	Philips	BC550B	Low Noise Transistor
TER3,TEL3	Philips	BC560B	Low Noise Transistor
TER4,TEL4	Philips	BC560B	Low Noise Transistor
TER5,TEL5	Philips	BC560B	Low Noise Transistor
TER6,TEL6	Philips	BC550B	Low Noise Transistor
TLR1,TLL1	Philips	BC550B	Low Noise Transistor
TLR2,TLL2	Philips	BC550B	Low Noise Transistor
TLR3,TLL3	Philips	BC560B	Low Noise Transistor
TLR4,TLL4	Philips	BC560B	Low Noise Transistor
TLR5,TLL5	Philips	BC560B	Low Noise Transistor
TLR6,TLL6	Philips	BC550B	Low Noise Transistor
TP1	Philips	BC550B	Low Noise Transistor

Diodes

DIR1,DIL1	Philips	BZX-79C12	12Volt zener diode
DIR2,DIL2	Philips	BZX-79C12	12Volt zener diode
DP1,DP2	Philips	1N4007	1Amp 1000V Diode
DP3,DP4	Philips	1N4007	1Amp 1000V Diode
DP5,DP6	Philips	BZX-79C12	12Volt zener diode
DP7,	Philips	BZX-79C12	12Volt zener diode

Regulators

GER1,GEL1	SGS 7824	+24V 1.5Amp Regulator
GER2,GEL2	SGS 7924	-24V 1.5Amp Regulator
GLR1,GLL1	SGS 7824	+24V 1.5Amp Regulator
GLR1,GLL1	SGS 7924	-24V 1.5Amp Regulator
GP1	SGS 7815	+15V 1.5Amp Regulator
GP2	SGS 7915	-15V 1.5Amp Regulator

Potenciometers

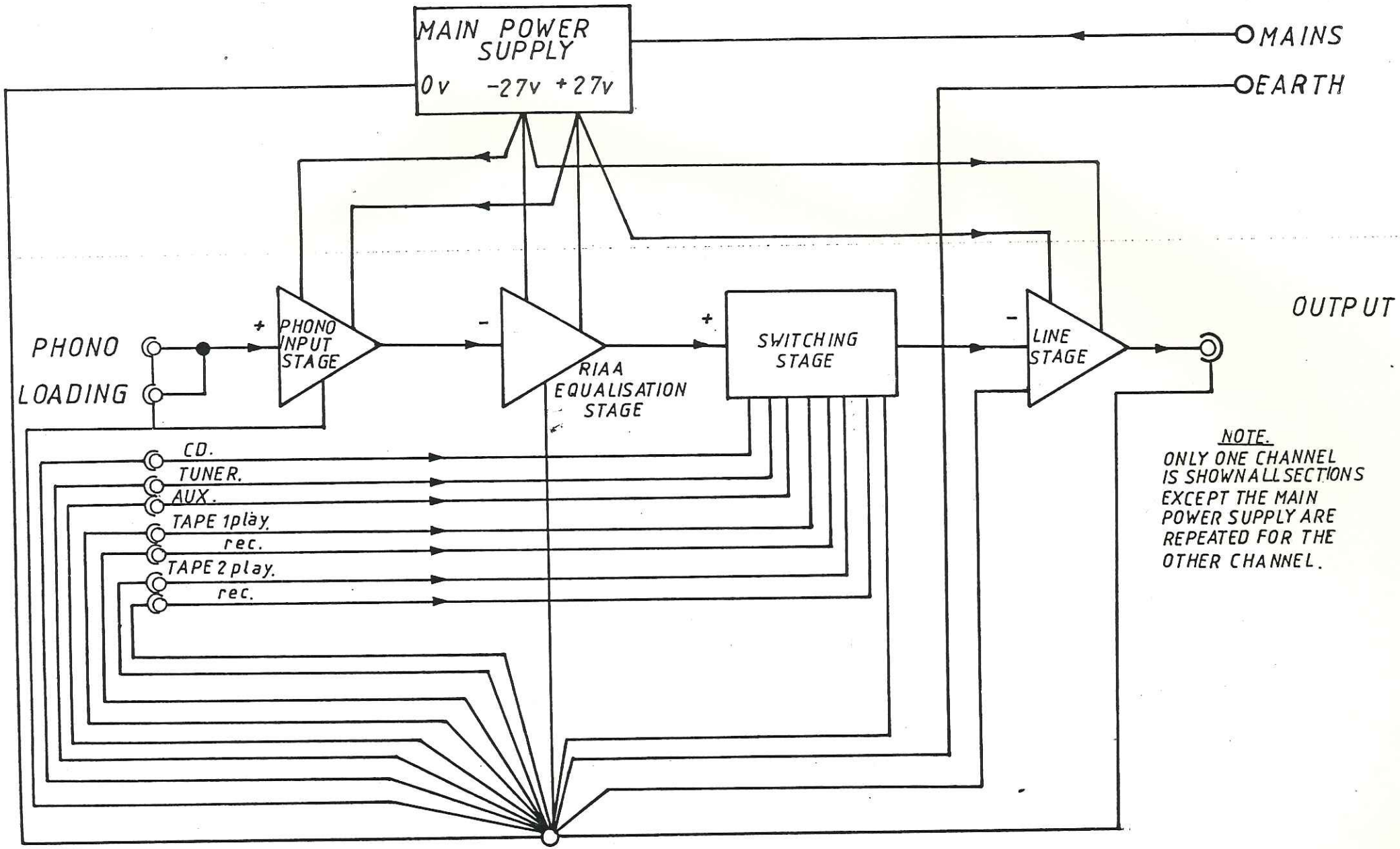
PL1	ALPS K272A002K-50DX2	50Kohm log dual log pot
PL2	ALPS K272A002K-100DX2	100Kohm lin dual log pot

Switches

Input Selector	ALPS SBU06	Switch Control Unit
	ALPS SSR24	Switch
Tape Selector	ALPS SBU06	Switch Control Unit
	ALPS SSR24	Switch
Gain Selctor	4pole DIL switch	

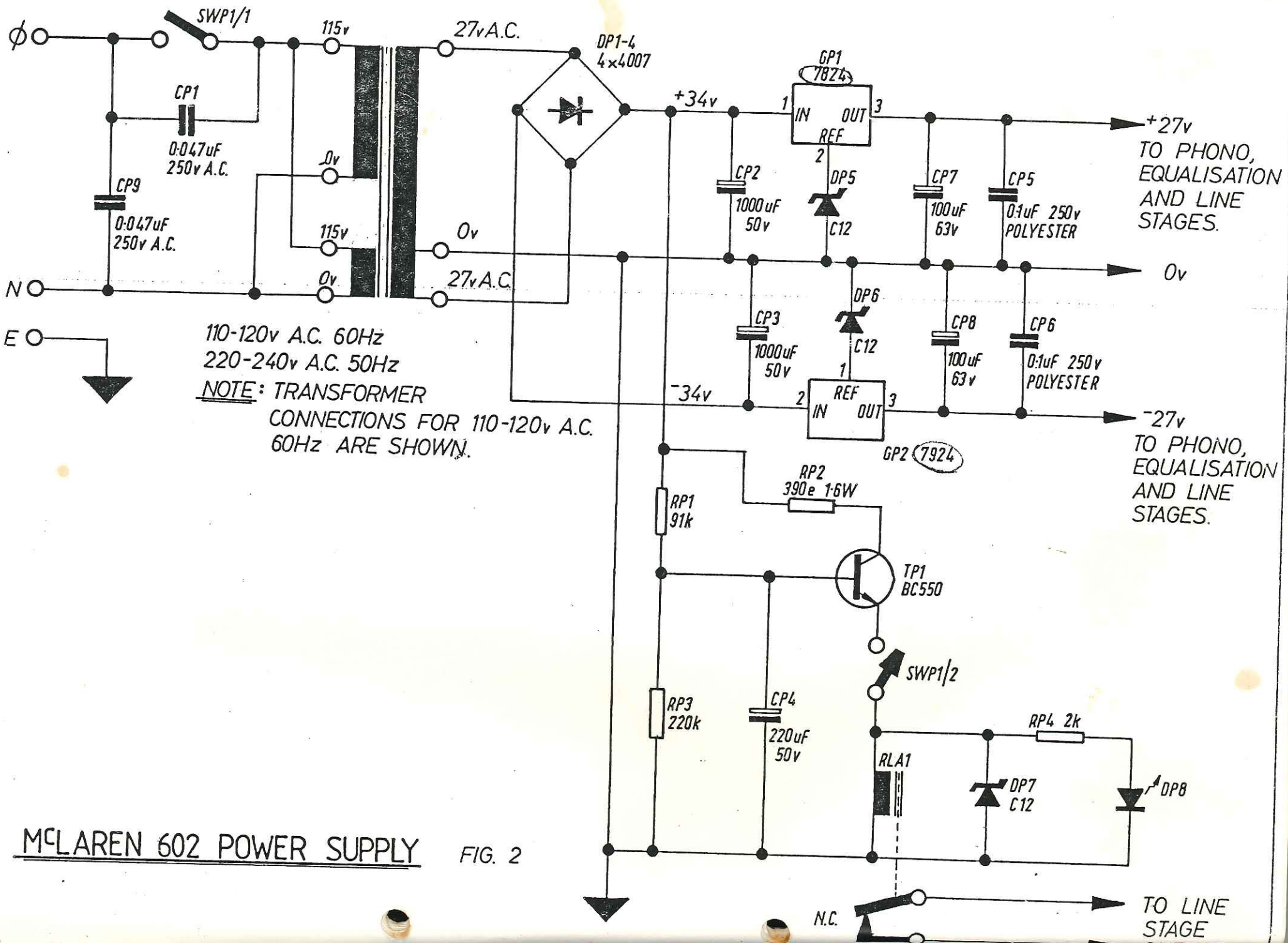
Other

RLA1	Philips 4823-280-23312	Takimiswa 12V relay
LED	H.P. HLMP-1401 YELLOW	Yellow LED



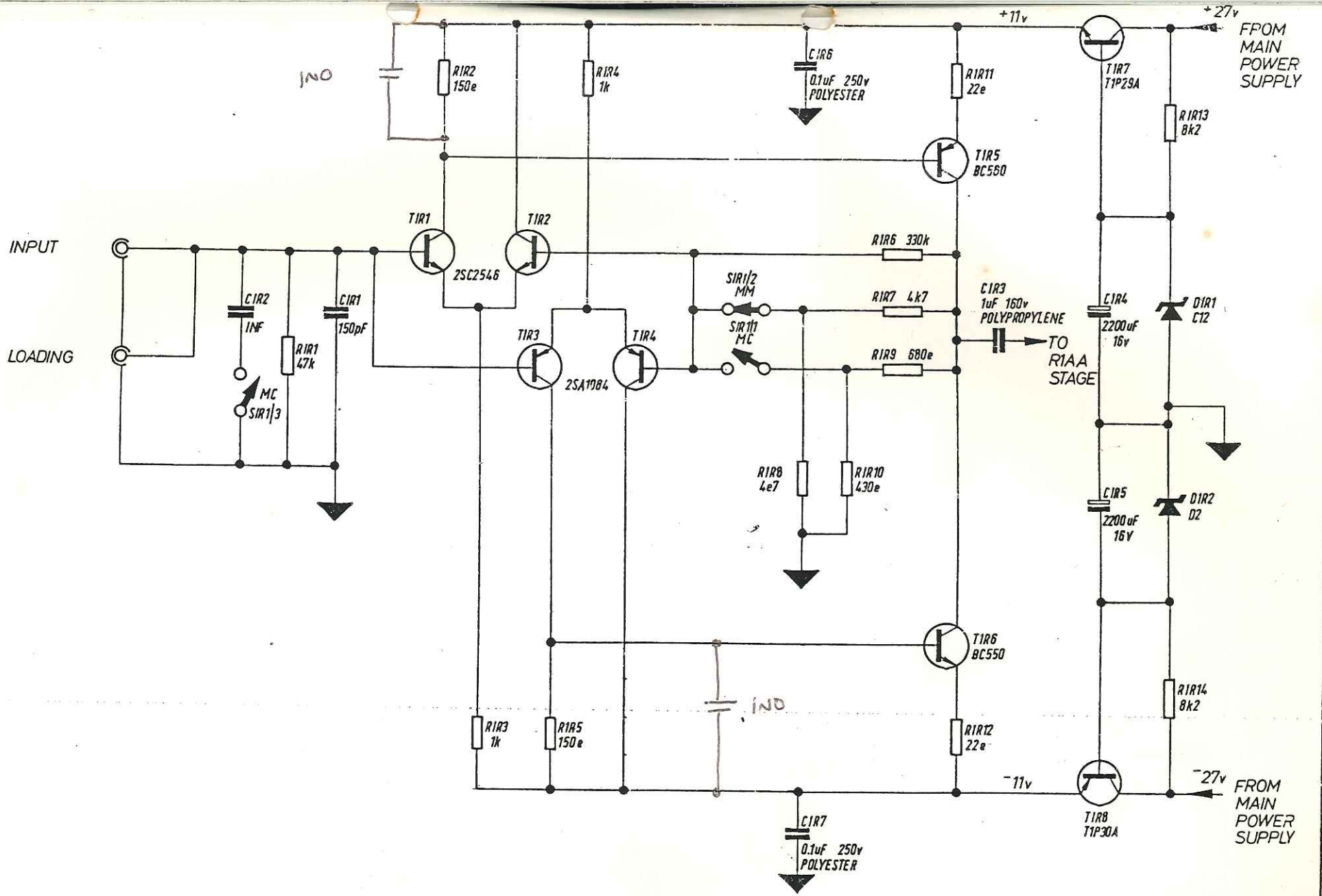
McLAREN 602 BLOCK DIAGRAM SHOWING STAR EARTH AND STAR POWER SUPPLY

FIG 1.

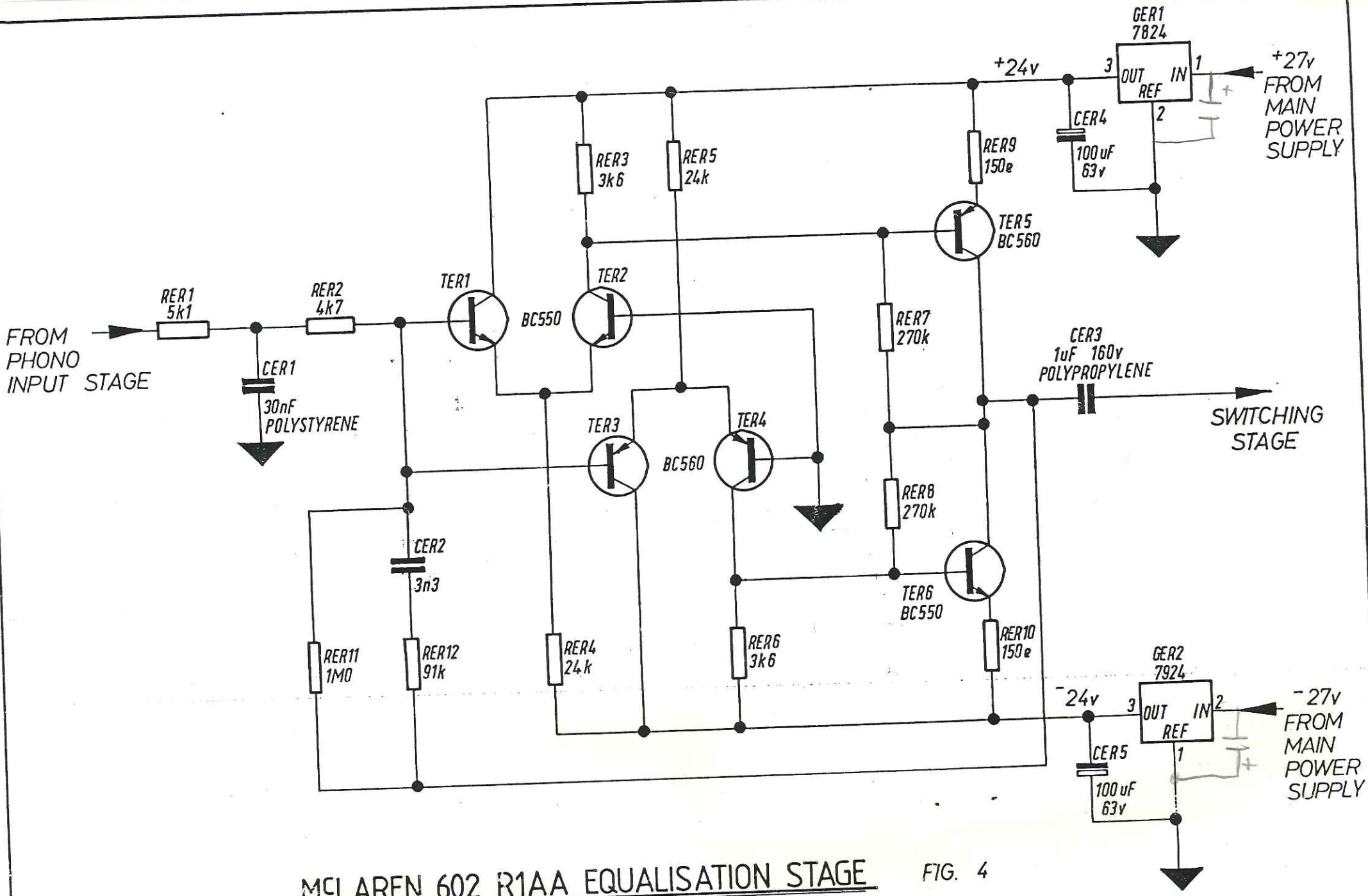


McLAREN 602 POWER SUPPLY

FIG. 2

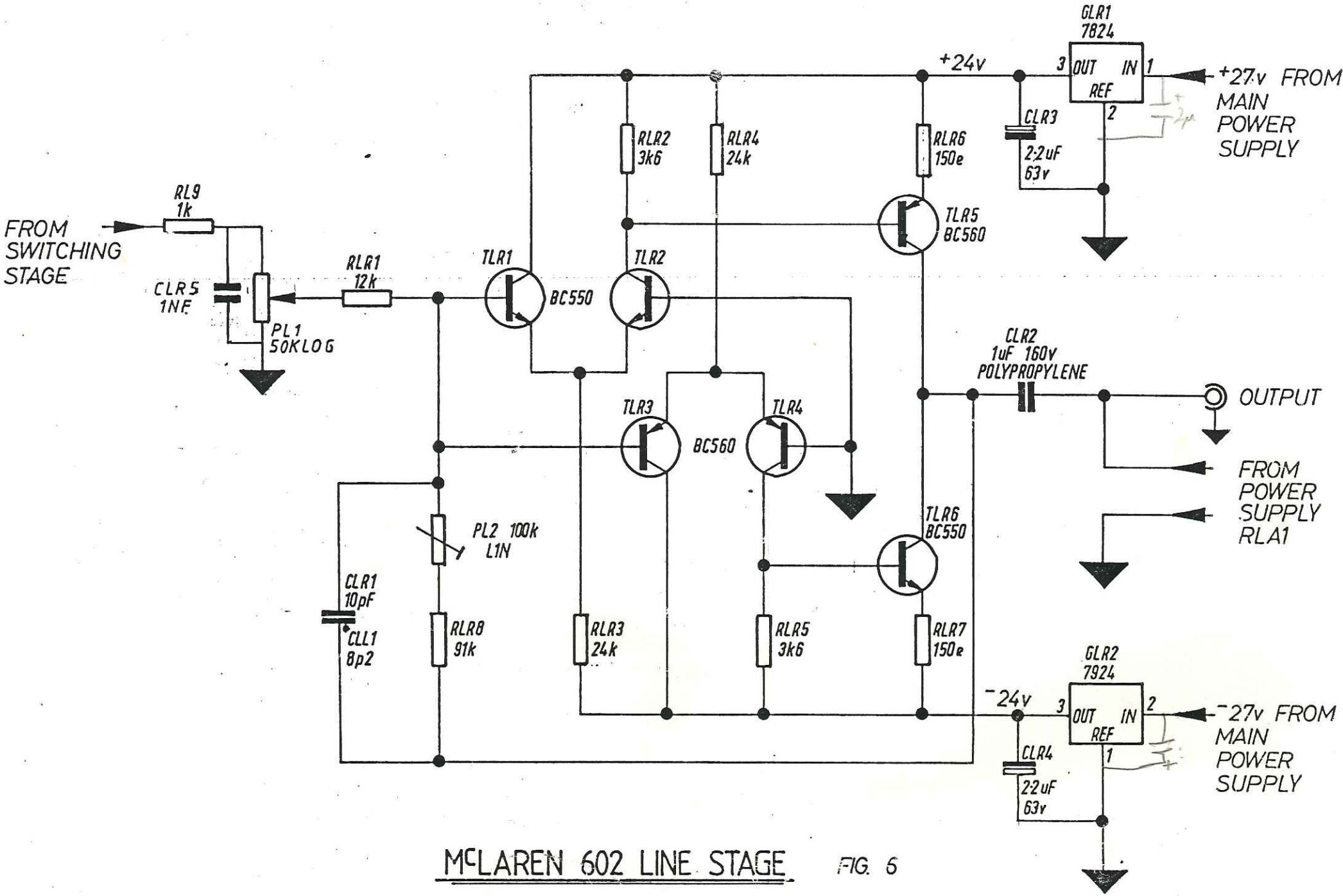


McLAREN 602 PHONO INPUT STAGE FIG. 3

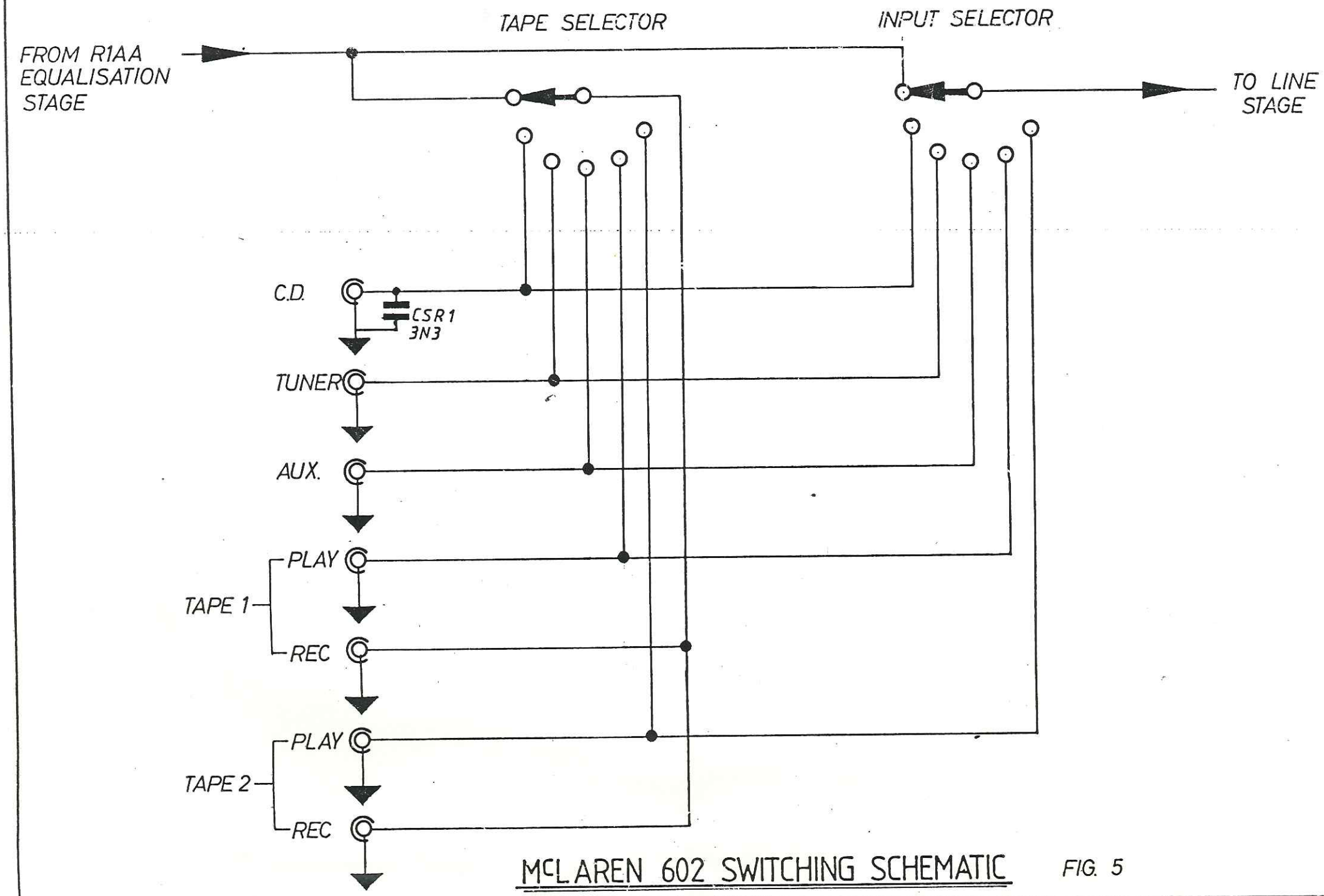


McLAREN 602 R1AA EQUALISATION STAGE

FIG. 4

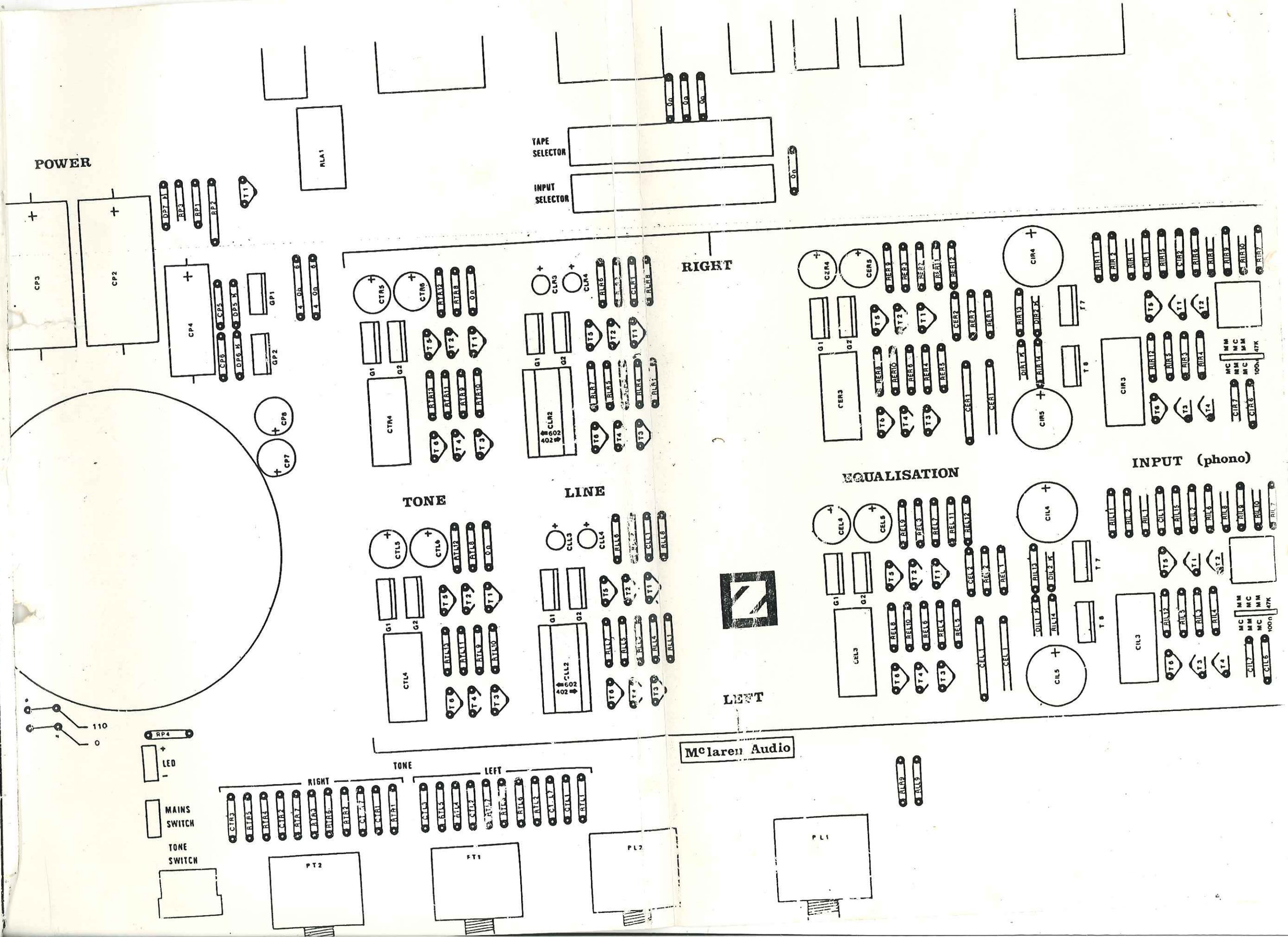


McLAREN 602 LINE STAGE FIG. 6



McLAREN 602 SWITCHING SCHEMATIC

FIG. 5


POWER
RLA1
TAPE SELECTOR
INPUT SELECTOR
CP3
CP2
CP4
CP5
CP6
CP7
CP8
DP7 M
RP3
RP1
RP2
T1
DP5 M
DP6 M
GP1
GP2
4 0n 6
4 0n 6
RIGHT
CTR5
CTR6
CTR4
RTR12
RTR8
0n
RTR13
RTR11
RTR9
RTR10
G1
G2
T5
T2
T1
T6
T4
T3
CLR3
CLR4
CLR2
RLR6
CLR1
RLR8
RLR7
RLR5
RLR4
RLR1
TONE
LINE
CTL5
CTL6
CTL4
RTL12
RTL8
RTL13
RTL11
RTL9
RTL10
CLL3
CLL4
CLL2
RLL6
CLL1
RLL8
RLL7
RLL5
RLL4
RLL1
LEFT
EQUALISATION
INPUT (phono)
CER4
CER5
CER3
RER9
RER3
RER7
RER11
RER12
RER8
RER10
RER6
RER4
RER5
CER2
RER2
RER1
CER1
CIR4
CIR5
CIR3
RIR11
RIR2
RIR1
CIR1
RIR15
CIR2
RIR6
RIR8
RIR9
RIR16
RIR7
RIR12
RIR5
RIR3
RIR4
CIR7
CIR6
MM MC
100n
47K
T7
T8
CEL4
CEL5
CEL3
REL9
REL3
REL7
REL11
REL12
REL8
REL10
REL6
REL4
REL5
CEL2
REL2
REL1
CEL1
CIL4
CIL5
CIL3
RIL11
RIL2
RIL1
CIL1
RIL15
CIL2
RIL6
RIL8
RIL9
RIL10
RIL7
RIL12
RIL5
RIL3
RIL4
CIL7
CIL6
DIL1 M
DIL2 M
RIL13
RIL14
110
0
RP4
LED
MAINS SWITCH
TONE SWITCH
PT2
FT1
PL2
PL1
ATR9
RTL9
McLaren Audio